

PLANIGALE GILESI (MARSUPIALIA, DASYURIDAE); A NEW SPECIES FROM THE INTERIOR OF SOUTH EASTERN AUSTRALIA

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SUMMARY

Planigale gilesi a new species of dasyurid marsupial is described and figured. Field notes on the specimens examined are included.

PLANIGALE GILESI*

Diagnosis: A robust *Planigale* (plate 1) differing from all other species of *Planigale* by the possession of only two premolar teeth in each upper and lower jaw.

Holotype: South Australian Museum no. M8406; adult male puppet skin and skull with torso in spirit, collected on 29 June 1969 by Messrs. P. Aitken, A. Kowanko, J. Forrest and J. Howard.

Type Locality: No. 3 Bore, Pastoral Property of Anna Creek, South Australia (lat. 28° 18'S., long. 136° 29' 40'E.).

Paratypes: No. 3 Bore, Anna Creek, South Australia. Male puppet skins and skulls: South Australian Museum nos. M8407, 25 July, 1969, P. Aitken, A. Robinson and M. Stanley; M8408 and M8409, 26 November 1969, P. Aitken, J. Forrest and J. Glover. Male in spirit: SAM no. M8410, 27 July 1969, P. Aitken, A. Robinson and M. Stanley. Female in spirit with skull extracted: SAM no. M8411, 25 August 1970, A. Kowanko and J. Glover.

Bellata, New South Wales (lat. 29° 55'S., long. 149° 47'E.). Female in spirit with skull extracted; Australian Museum no. M7033, 27 February 1945, J. Kirkby. Male in spirit with skull extracted: AM no. M7393, May 1948.

Brewarrina, New South Wales (lat. 29° 57'S., long. 146° 51'E.). Male in spirit with skull extracted: AM no. M7819, 1954, K. Turnbull. Female in spirit with skull extracted: AM no. M7820, 1954, K. Turnbull.

Lake Cawndilla, Kinchega National Park, New South Wales (lat. 32° 30'S., long. 142° 18'E.). Male in spirit: AM no. M9190, 20 May 1969, M. Gray.

Descriptive Methods: Pelage colour nomenclature follows the standards of Ridgway (1912). All body weights are in grams and all anatomical measurements are in millimetres with the terminology, unless otherwise stated, after Cockrum (1955). Skull measurements were taken with Helios dial

* In honour of Ernest Giles (1835-97) the most intrepid of Australian explorers and, like this planigale, an accomplished survivor in deserts.

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calipers under a binocular microscope at various magnifications up to x20. Flesh dimensions were obtained from freshly killed material in the case of South Australian Museum specimens and from spirit preserved material in the case of Australian Museum specimens. All measurements were made by the author.

External Features: Dorsally the soft, dense fur is 8 mm long on the rump where the basal 5 mm are sooty black, the median 2.5 mm are pinkish cinnamon and the apical 0.5 mm are fuscous. The fur is 4 mm long on the crown and 1 mm long on the muzzle where it becomes more bristly with virtually no sooty black base. Interspersed with the fur are medially-thickened fuscous black spines 10.5 mm long on the rump reducing to 2 mm on the muzzle. The back is thus a brindled cinnamon colour from rump to rhinarium, although two of the skins examined (SAM nos. M8408 and M8409) have much paler spines and, in consequence, less brindled appearances. A single ring of fuscous black hairs is present around each eye and there is a dark patch in front of each eye where the tips of the fur are fuscous black. Mystacial vibrissae number approximately 16 on each side, are up to 12 mm long and are predominantly fuscous black. Other vibrissae per side are: supra-orbital, 2, fuscous black; genal, 8, some fuscous black, others white; ulnar carpal, 3, white; anconeal, 1, white; median antibrachial, 1, white; submental, 4, white. In addition there are 4 white, interramal vibrissae.

On the cheeks, flanks and shoulders, behind the ears and inside the ears, the fuscous tips of the fur are markedly reduced and spines are virtually absent. These areas are thus pinkish cinnamon in colour.

Ears rounded and slightly fleshy, each with a weak ventral lobe defined by a shallow notch in the posterior margin, an antero-dorsal overfold and a posteriorly concave, anteriorly pointed, untwisted supratragus 3.5 mm long by 2.5 mm broad. Externally, the basal segment of each ear is naked with a surrounding apical area thinly covered by short pinkish cinnamon hairs. Internally, the concha and supratragus of each ear carry irregularly spaced, fine white bristles and each pinna has two thick tufts of pinkish cinnamon hairs originating on the postero-internal margin, one immediately above the ventral lobe the other at crown level. The remainder of each pinna is more thinly covered with short, pinkish cinnamon hairs.

Rhinarium naked, fuscous black with a complete median groove, no philtrum and semicircular nostrils directed antero-laterally.

Ventrally the fur is soft with no spines and is 5 mm long on the belly where the basal half is dark mouse gray and the apical half is pinkish buff. On the interramal region the fur is 1.5 mm long and pinkish buff throughout. Two of the skins examined (SAM nos. M8408 and M8409) have paler ventral fur, basally deep mouse gray and apically pale olive buff. The fur on their interramal regions is also pale olive buff.

Scrotum pendulous with fuscous black pigmented skin and a thick covering of pinkish buff hairs (pale olive buff on SAM nos. M8408 and M8409).

Pouch equipped with 12 teats and filled with fine, white hairs up to 6 mm long. It varies in development amongst the three females examined. In one (SAM no. M8411) it is an oval depression approximately 4 mm long by 3 mm wide with scarcely perceptible antero-lateral lips. In another (AM no. M7033) it is an anteriorly deepened pocket with a transverse postero-ventral opening 3.5 mm wide. In the third (AM no. M7820) it is an irregular, mammary area up to 18 mm in diameter with a fleshy, peripheral lip 2.5 mm deep.

Tail slightly incrassated, tapering towards the tip and sometimes fattened for two-thirds of its length, in which cases basal incrassation is more obvious (SAM nos. M8407, M8408 and M8410). It is bicoloured with a thin covering of stiff hairs 3.5 mm long, increasing to 4.5 mm on the distal third of the underside, but with no brush. Dorsally the hairs are pinkish cinnamon with fuscous tips, although fuscous tipping may be much reduced or absent (SAM nos. M8407 and M8408) and some totally fuscous hairs occur at the distal extremity. Ventrally the hairs are the same colour as the apical half of the belly fur, either pinkish buff or pale olive buff throughout. The hairs of the tail tend to grow in ragged whorls based between 4 and 5 mm apart and in those specimens with fattened tails the whorl hairs become very divergent, producing a rather sparse covering at their apices through which the fuscous black pigmented tail skin can clearly be seen. In such specimens, therefore, the tails exhibit faint patterns of alternating light and dark transverse bands (SAM nos. M8407 and M8408).

Both fore and hind feet well covered above by short pinkish cinnamon hairs with a fringe of silvery hairs bordering each naked sole. Soles of fore feet fuscous, soles of hind feet fuscous black (colours fade in spirit). Fore feet each 4 mm broad with 5 strongly clawed digits (formula: $3 > 4 > 2 > 5 > 1$) and 6 well developed pads. Soles and pad-bases coarsely granular with granules up to 0.3 mm across. Each pad-base is surmounted by a finely striated apical pad: 1st interdigital round, 0.6 mm in diameter; 2nd and 3rd interdigitals oval, 0.5 x 0.9 mm; 4th interdigital oval, 0.6 x 0.8 mm; hypothenar proximo-internally flattened and shaped like a bulbous hook with an external shaft, greatest breadth 0.8 mm by 1.6 mm long; thenar proximally flattened, demi-oblong, 0.8 mm broad. Hind feet (plate 2) each 3.5 mm broad across the bases of digits 2-5 with 4 clawed digits and a clawless hallux (formula: $3 > 4 > 2 > 5 > 1$) plus 6 well developed pads. Soles and pad-bases coarsely granular with granules up to 0.4 mm across, although one larger granule, 0.5 mm in diameter, is usually present near the external margin of each sole between the 3rd interdigital and hypothenar pads and a few others of similar size occur on each heel. Each

pad-base is surmounted by a finely striated apical pad. 1st (hallucal), 3rd and 4th interdigitals oval, 0.7 x 1 mm; 2nd interdigital oval, 0.7 x 1.1 mm; hypothenar oval, 1.4 x 0.8 mm; thenar disto-internally bulbous crescentic, greatest breadth 0.9 mm by 1.5 mm long.

Dimensions of the soles and pads were obtained from a specimen that had been preserved in 70% spirit for approximately 6 months (SAM no. M8410). Some other specimens, examined after much longer immersion in spirit, had apparently narrower hind feet and shrunken pad-bases that had become confluent with the soles.

Flesh dimensions of selected specimens are presented in Table 1. Spirit preserved specimens with extracted skulls were not measured.

Table 1. Flesh Dimensions of *Planigale gilesi*

Measurement	♂ Holotype M8406 (SAM) Anna Creek	♂ M8407 (SAM) Anna Creek	♂ M8408 (SAM) Anna Creek	♂ M8409 (SAM) Anna Creek	♂ M8410 (SAM) Anna Creek	♂* M9190 (AM) Kincheha	♀ M8411 (SAM) Anna Creek
Body length ...	71.5	79	78	73	77	63	58
Tail length . . .	72	72	60	—	69	63	59
Length of hind foot (without claws)	10.8	11.4	11	10.5	10.8	10.4	9.6
Height of ear (from notch)	9.2	10.5	10.3	10.4	10.5	8.7	9.5
Weight	9 (starved)	17	15	—	15	—	—

* Measured from spirit

Skull Characters (plates 3a, b, c, d): Dorsal aspect of cranium flat with extremely thin bones, a minute sagittal crest and insignificant lambdoidal crests. Zygomatic arches evenly convex. Interorbital region flat and unridged with bevelled edges, a slight median depression at the posterior extremities of the nasals and the anterior half of the median frontal suture irregularly dentate. Post-orbital processes barely discernible or absent with no pronounced post-orbital constriction. Anterior halves of nasals either parallel sided or marginally expanded in front, posterior halves flared, the greatest width across the nasals being at their points of contact with the fronto-maxillary sutures. Postero-dorsal tips of premaxillae truncated.

A pair of slim, anteriorly pointed, incisive foramina pierce the palate with their posterior extremities between the canines. Two narrow, sometimes dissimilar, posterior palatal vacuities are also present with their anterior margins between M^{2-2} and their posterior margins between M^{3-3} . Pterygoid hamulae slender and deeply hooked behind. Alisphenoid bullae bulbous, the greatest breadth of each bulla being approximately equal to the minimum

distance between both bullae. Each periotic bulla with a markedly inflated distal crescent separated by a shallow sulcus from a less inflated proximal segment and abutted on its postero-mesial wall by the anteriorly flanged, blunt para-occipital process.

Dental formula: $I \frac{4}{3}$: $C \frac{1}{1}$: $P \frac{2}{2}$: $M \frac{4}{4}$. Teeth, upper jaw: I^1 prominent, set apart from I^{2-4} , which are smaller with I^2 equal in size to I^3 and both larger than I^4 by crown height but not crown length. I^{2-4} each with a buccal and a lingual cingulum and a minute talon that is most marked on I^4 . Canine bucco-lingually flattened with a complete cingulum and three times as high as I^4 , from which it is separated by a diastema of 0.5 mm. In three specimens examined (SAM no. M8501, AM nos. M7033 and M7819) a distinct talon is also present on each canine. Pre-molars bucco-lingually flattened, each with a buccal and a lingual cingulum, a minute anterior cusp and a relatively longer talon. The anterior cusp is most obvious on the first premolar and the talon is largest on the second premolar. First premolar set apart from the canine and two thirds as large as the second premolar by both crown height and crown length, second premolar offset longitudinally in line with the posteriorly broadened rostrum. Molars moderately high cusped with M^4 lacking the entire posterior half. M^{1-4} each with a dorsally displaced protocone. M^{1-3} each with a postero-lingual cingulum, a dominant metacone, a relatively much lower paracone and a parastyle, mesostyle and metastyle, of which the parastyle in M^1 is antero-dorsally displaced and the mesostyle in M^3 is reduced in height compared with the same cusp in either M^1 or M^2 . M^{2-4} each with an anterior cingulum.

Teeth, lower jaw: Incisors slightly procumbent, each with a bucco-lingually flattened incisal edge and a lingual cingulum. I_1 not set apart from and twice as high as I_2 , which in turn is a little larger than I_3 by both crown height and crown length. A minute talonid is present on I_3 . Canine twice as high and three times as long as I_3 with a lingual and a buccal cingulum plus a talonid. Pre-molars bucco-lingually flattened, the first two-thirds as large as the second by both crown height and crown length, each with a talonid and a buccal and a lingual cingulum. Molars high cusped with M_4 lacking the postero-buccal quarter. M_{1-4} each with an antero-buccal cingulum, a posterior cingulum and a dominant protoconid, plus a metaconid and a paraconid, both of which are relatively much lower, the latter being particularly low in M_1 . Each also with a minute entoconid plus a hypoconid and a hypoconulid, of which the hypoconid is almost totally suppressed in M_4 , is highest in M_1 and decreases evenly in height through M_{2-3} , whereas the hypoconulid is highest in M_4 and equal and lower in height through M_{1-3} .

Skull and tooth dimensions are presented in Table 2.

TABLE 2. Skull and Tooth Dimensions of *Planigale gilesi*

Measurements	♂ Holotype M8406 (SAM) Anna Creek	♂ M8407 (SAM) Anna Creek	♂ M8408 (SAM) Anna Creek	♂ M8409 (SAM) Anna Creek	♀ M8411 (SAM) Anna Creek	♂ M7033 (AM) Bellata	♀ M7393 (AM) Bellata	♂ M7819 (AM) Brewarrina	♀ M7820 (AM) Brewarrina
Condylo-premaxilla length	20.6	20.6	20.4	19.6	17.6	19.7	20.8	21.0	—
Palatilar length (including spine)	10.2	10.4	10.1	9.5	8.4	9.5	10.0	10.1	—
Zygomatic breadth	11.5	11.5	11.1	10.7	9.8	10.5	10.8	11.7	—
Cranial breadth	9.9	9.6	9.5	9.4	8.8	9.1	9.8	9.6	—
Least interorbital constriction ..	4.6	4.6	4.5	4.5	4.3	4.4	4.4	4.4	4.6
Greatest breadth across lachrymals	6.5	6.6	6.3	6.0	5.5	6.1	6.2	6.2	6.3
Maxillary breadth at first pre- molars	3.8	3.9	3.5	3.6	3.3	3.4	3.6	3.8	—
Greatest width across upper molars	6.5	6.5	6.6	6.3	6.0	6.5	6.8	6.6	6.7
Depth of cranium in front of bullae	4.3	4.3	4.3	4.1	3.8	4.1	3.9	4.4	—
Length of incisive foramen	1.5	1.5	1.3	1.2	1.2	1.5	1.5	1.7	—
Length of palatal vacuity	1.5	1.3	1.0	1.2	1.1	1.1	1.1	1.7	1.4
Width of palatal vacuity	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4
Length of bullae (alisphenoid +periotic)	4.9	5.0	5.0	—	—	4.8	5.0	5.1	—
Greatest breadth of alisphenoid bulla	3.0	2.8	2.8	—	—	2.6	2.7	2.6	—
Length of nasals	8.2	8.5	8.7	7.7	6.5	7.7	—	8.4	—
Greatest width of nasals	3.6	3.4	3.7	3.4	2.9	3.2	3.2	3.2	3.6
Length of mandible	14.4	14.4	14.3	13.0	12.0	14.7	14.5	—	—
Length of mandibular symphysis	2.7	2.5	2.6	2.4	2.6	2.8	2.7	2.4	2.4
Length of maxillary tooth row (alveolar)	9.2	9.3	9.1	8.9	8.1	9.2	9.8	9.4	—
Length of mandibular tooth row (alveolar)	7.8	8.1	7.9	7.5	7.2	8.1	8.4	8.0	8.0
Crown length M1-4 (inclusive) ..	4.5	4.4	4.3	4.3	4.1	4.6	4.9	4.5	4.5
Crown length of 1st premolar	0.7	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7
lower	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.7
Crown length of 2nd premolar	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9
lower	0.9	0.9	0.9	0.9	0.8	0.9	1.0	0.9	0.9
Crown height of 1st premolar	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.4
lower	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	—
Crown height of 2nd premolar	0.7	0.7	0.8	0.6	0.6	0.7	0.7	0.7	—
lower	0.8	0.7	0.8	0.7	0.7	0.6	0.7	0.7	—

Field Notes: No. 3 Bore, Anna Creek, is situated at the north-eastern tip of an isolated belt of sandridges, which transect the stony desert tableland south of the Neales River on the western side of Lake Eyre North, approximately 70 km north-east of Anna Creek homestead. The bore was originally sunk in 1917, but was redrilled in 1966 when an unsuccessful attempt was made to control its output with casing. No mound has formed around the bore-head through which 3,337,000 litres of water erupt daily via a circular hole 7 m in diameter. On leaving the bore-head the water flows down a meandering bore-drain for about 300 m before spreading out to form a shallow swamp. Beyond the swamp the water continues to trickle across the tableland for up to 600 m through an expanding system of branched, attenuating channels, in which the water depths are variable. In consequence, the extremities of the channels are often dry, but on such occasions the water table has never been found more than 15 cm below their beds. Water temperature at the bore-head is 48°C cooling to below 40°C at the entrance to the swamp. Water salinity is 3,614 parts per million in the bore-drain, which is flanked by a thin, white mineral crust deposited on its banks. Desert gobies (*Chlamydogobius eremius*) and hardyheads (*Craterocephalus eyresii*) abound in both the bore-drain and the swamp.

The tableland adjacent to the bore, where the average rainfall is less than 125 mm per annum, is vegetated by a well spaced, shrub steppe community dominated by nitre-bush (*Nitraria schoberii*) with salt-bushes (*Atriplex velutinella* and *A. angulata*) plus another chenopod (*Babbagia dipterocarpa*).

The area influenced by the bore is vegetated by a separate community comprising three distinct plant associations.

1. A bulrush association (plate 4), not found more than 1 m from surface water, growing in mud along the edges of the bore-drain and both in and around the swamp. This association is dominated by tall, dense stands of bulrush (*Typha angustifolia*) basally augmented with tussocks of a small sedge (*Cyperus laevigatus*).
2. A sand-spurry association growing in periodically inundated clearings along the channels. This association is dominated by low mats of sand-spurry (*Spergularia marina*) admixed with love grass (*Eragrostis dielsii*) and scattered examples of a small sedge (*Scirpus maritimus*), pop salt-bush (*Atriplex spongiosa*) and an "everlasting" (*Helipterum floribundum*).
3. A sedge association (plate 5) growing around the bore-head, over the moist ground between the channels and flanking the bullrushes along the bore-drain. This association is

dominated by thick, interwoven clumps of umbrella sedge (*Cyperus gymnocaulus*) occasionally entangled with bushes of a samphire (*Arthrocnemum leiostachyum*). Odd examples of a bindyi (*Bassia ventricosa*) and ruby salt-bush (*Enchlaena tomentosa* var. *glabra*) are also found throughout the association.

All specimens of *Planigale gilesi* collected at No. 3 Bore were trapped in Sherman live animal traps baited with a mixture of rolled oats, honey, peanut paste and beef dripping. Two captures were made in the bulrush association along the bore-drain and four others in the sedge association, two within 2 m of the bore-head and two between the channels less than 3 m from an inundated sand-spurry clearing. Both the bulrush and sedge associations offer superb sanctuaries for small mammals since each provides a formidable barrier against aerial and terrestrial predators, an internal supply of food and nesting materials and an effective insulation against extremes of temperature and humidity. In August, 1969, a comparison of ambient temperatures with those in a natural runway under the sedge association revealed that over a 24 hour period temperatures under the sedge remained fairly constant between 9°C. (0630 h) and 15°C. (1400 h), whereas ambient temperatures fluctuated between 1°C. (0630 h) and 21°C. (1100 h) (M. Stanley, unpublished). It is probable that the high humidity resulting from moist conditions under both the bulrush and sedge associations remains equally constant.

In captivity examples of *Planigale gilesi* do not display either distinct nocturnal or distinct diurnal rhythms, but exhibit short bursts of activity spread throughout each 24 hour period and in view of the protection and insulation afforded by their habitat it is feasible that their activity patterns might be similar in the wild. Brown desert mice (*Pseudomys desertor*), which are abundant throughout the sedge association at No. 3 Bore, appear to be most active at night, but can also be trapped quite readily during the day. Thus indicating that in this habitat they too are not strictly orientated to either nocturnal or diurnal activity.

Other mammals inhabiting No. 3 Bore are stripe-headed sminthopses (*Sminthopsis frogatti*), which are fairly common throughout the sedge association; long-haired rats (*Rattus villosissimus*), which have a permanent breeding colony confined to the bulrush association; house mice (*Mus musculus*) of which a few occur in the sedge association around the bore-head; and rabbits (*Oryctolagus cuniculus*), which fluctuate in numbers and burrow on the fringes of the sedge association and around the nitre-bushes in the surrounding tableland. Visiting mammals observed at or near the bore have been numerous dingoes (*Canis familiaris dingo*), some red foxes (*Vulpes*

vulpes), occasional feral domestic cats (*Felis catus*) and small mobs of feral Arabian camels (*Camelus dromedarius*), feral donkeys (*Equus asinus*) and brumbies (*Equus caballus*). Domestic cattle (*Bos taurus*) also water at the bore.

Damage to the bore vegetation by rabbits appears to be insignificant and damage to the ground by the hooves of the other introduced herbivores is slight and limited to the edges of the swamp, which is the only place where the water is cool enough and still of sufficient depth for comfortable drinking. Other bores and springs in the surrounding region are not so free of hoof damage, their vegetated banks being stamped regularly into inhospitable bogs of mud and dung. No small native mammals have been captured at any of these sites despite intensive trapping. The introduced carnivores probably prey on *Planigale gilesi* occasionally, but in all the dingo and red fox scats examined rabbits remains were the only mammalian residue. No cat scats were found. Possible avian predators observed over the bore have been whistling eagles (*Haliastur sphenurus*), fork-tailed kites (*Milvus migrans*), brown hawks (*Falco berigora*) and barn owls (*Tyto alba*). Possible reptilian predators caught in the sedge association have been King brown snakes (*Pseudechis australis*) and sharp-snouted snakes (*Pseudonaja acutirostris*).

Scats of *Planigale gilesi* removed from traps in which their producers had been captured contained fragments of insects exoskeletons, indicating that these planigales are at least partially insectivorous. In captivity they consumed meal beetle larvae, early instar locusts and small moths with avidity. Chopped lambs liver was also accepted, but with less enthusiasm. Habitat data for examples of *Planigale gilesi* captured other than at No. 3 Bore are confined to the Kinchega specimen (AM no. M9190), which according to the collector was also taken from a sedge association adjacent to water.

The breeding period for members of *Planigale gilesi* has yet to be determined. Of the three females examined two have undeveloped pouches. One of the latter (SAM no. M8411) was collected in winter (25 August) and the other (AM no. M7033) was obtained in late summer (27 February). The third female (AM no. M7820) has a lactating pouch, but the exact date of her collection is unknown. Males in the series examined show insufficient variation in scrotal size for this character to be used as a reliable guide to breeding activity.

Relationships: Four species of *Planigale* have been described previously: *P. ingrami* (Thomas), 1906, from the north of the Northern Territory, but known also from eastern and northern Queensland (Troughton, 1928); *P. substillissima* (Lönnerberg), 1913, from the Kimberly district of Western Australia; *P. tenuirostris* Troughton, 1928, from north-central and north-western New South Wales and south-western Queensland, but known also

from east-central South Australia (SAM no. M8405); and *P. novaeguineae* Tate and Archbold, 1941, from Papua. The range of *Planigale gilesi* overlaps that of *P. tenuirostris* in north-western New South Wales. All four species differ from *Planigale gilesi* by the possession of 3 premolar teeth in each upper and lower jaw. Lönnberg (1913) actually described *P. subtilissima* as lacking P_{4-4} , but Tate (1947) in a review of the genus corrected this error after re-examining the holotype.

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Plate 1. *Planigale gilesi* ♂; M8410 (SAM), Anna Creek, South Australia. (Photo by Roman Ruehle.)



Plate 2. Hind foot of *Planigale gilesi*; M8410 (SAM). (Photo by Roman Ruehle.)



Plate 3. (a) Skull of *Planigale gilesi*; dorsal view of eranium and upper jaws (holotype). (Photo by Roman Ruehle.)



Plate 3. (b) Skull of *Planigale gilesi*; ventral view of eranium and upper jaws (holotype). (Photo by Roman Ruehle.)



Plate 3. (c) Skull of *Planigale gilesi*; lateral view of cranium and upper jaws (holotype). (Photo by Roman Ruehle.)



Plate 3. (d) Mandible of *Planigale gilesi*; lateral view (holotype). (Photo by Roman Ruehle.)



Plate 4. Bore-drain and bullrush association; No. 3 Bore, Anna Creek, South Australia. (Photo by the author.)



Plate 5. Sedge association; No. 3 Bore, Anna Creek, South Australia. (Photo by the author.)